FIG. 1

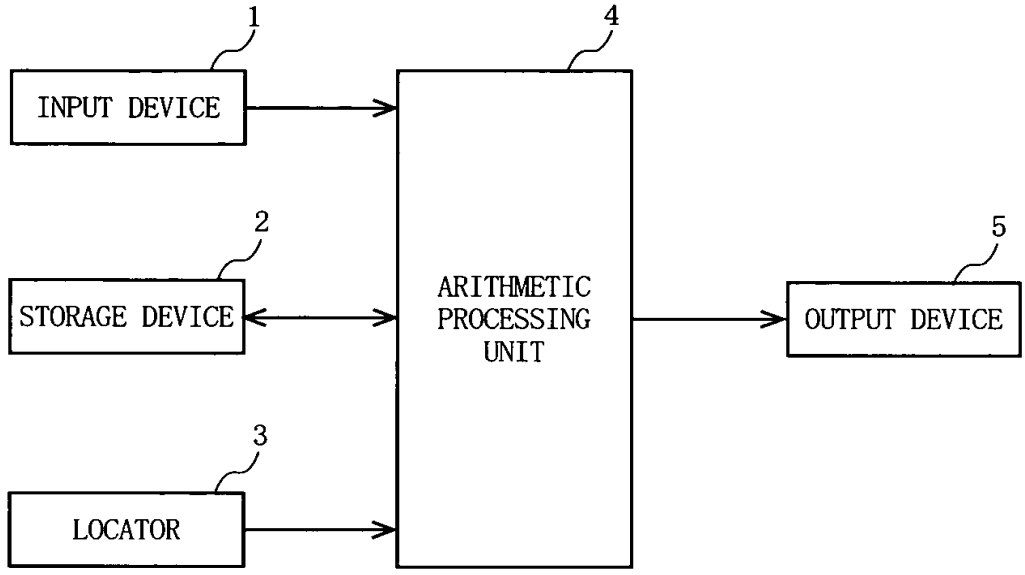
1
INPUT DEVICE
2
STORAGE DEVICE
3
LOCATOR
4
ARITHMETIC PROCESSING UNIT
5
OUTPUT DEVICE

FIG. 2

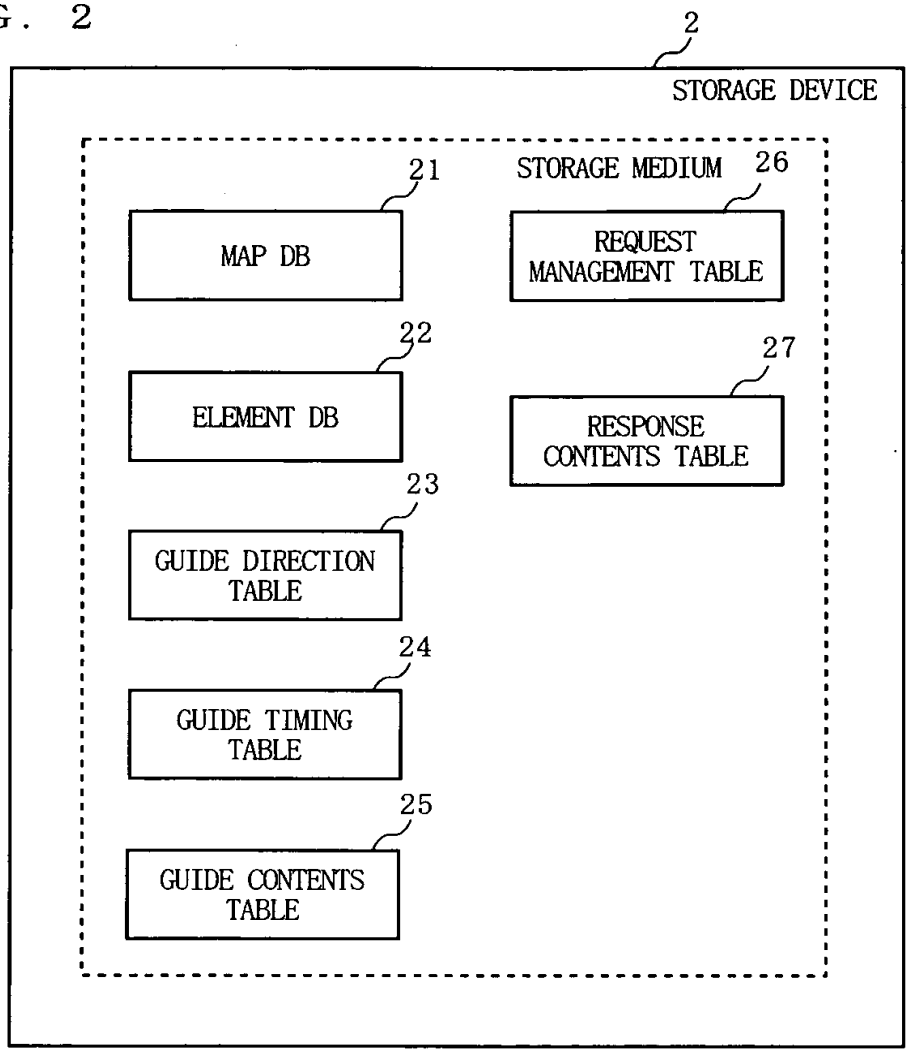
2
STORAGE DEVICE
STORAGE MEDIUM
21
MAP DB
22
ELEMENT DB
23
GUIDE DIRECTION TABLE
24
GUIDE TIMING TABLE
25
GUIDE CONTENTS TABLE
26
REQUEST MANAGEMENT TABLE
27
RESPONSE CONTENTS TABLE

FIG. 3

ELEMENT NUMBER	PHRASE
1	ONSEI ANNAI WO
2	KAISHI SHIMASU
3	SHUURYOU SHIMASU
4	OYOSO
5	KONOSAKI
6	MAMONAKU
7	5KM DE
8	2KM DE
9	1KM DE
10	700M DE
11	500M DE
12	300M DE
13	MEJIRUSHI
14	MOKUTEKICHI
15	SOUKOU KYORI WA
16	SHOYOU JIKAN WA
17	RYOUKIN WA
18	DESU
19	KM
20	M
21	JIKAN
22	HUN
23	EN
24	ATO
25	HAI
26	IIE
...	...
101	HIDARI NANAME ZENPOU
102	HIDARI HOUKOU
103	HIDARI NANAME KOUHOU
104	U TAAN HOUKOU
105	MIGI NANAME KOUHOU
106	MIGI HOUKOU
107	MIGI NANAME ZENPOU
...	...
201	KONBINIENSU SUTOA GA
202	GASORIN SUTANDO GA
...	...
210	FAMIRII RESUTORAN GA
...	...

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ELEMENT NUMBER	PHRASE
301	100000
302	90000
...	...
...	...
...	10000
...	9000
...	...
...	1000
...	900
...	...
...	100
...	90
...	...
345	10
...	9
...	...
346	1
...	...
1001	A KOUSA TEN WO
1002	B CHOU WO
1003	C DOORI WO
...	...

FIG. 4A

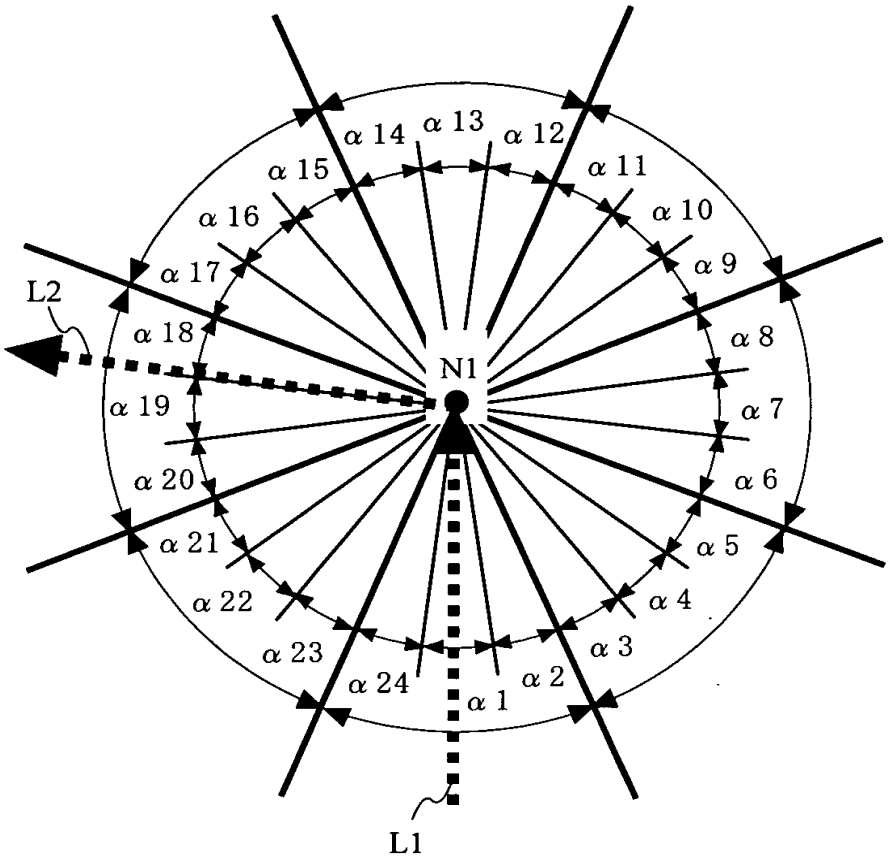

FIG. 4B

23

GUIDE DIRECTION TABLE	
ANGULAR RANGE	GUIDE DIRECTION
α 12- α 14	CHOKUSHIN HOUKOU (STRAIGHTFORWARD) (NO GUIDANCE)
α 15- α 17	HIDARI NANAME ZENPOU (DIAGONALLY FORWARD LEFT)
α 18- α 20	HIDARI HOUKOU (LEFT)
α 21- α 23	HIDARI NANAME KOUHOU (DIAGONALLY BACKWARD LEFT)
α 24, α 1, α 2	U TAAN HOUKOU (U-TURN DIRECTION)
α 3- α 5	MIGI NANAME KOUHOU (DIAGONALLY BACKWARD RIGHT)
α 6- α 8	MIGI HOUKOU (RIGHT)
α 9- α 11	MIGI NANAME ZENPOU (DIAGONALLY FORWARD RIGHT)

FIG. 5

GUIDE TIMING TABLE
AT THE START OF ROUTE GUIDANCE
700M BEFORE GUIDE OBJECT INTERSECTION
300M BEFORE GUIDE OBJECT INTERSECTION
100M BEFORE GUIDE OBJECT INTERSECTION
2KM BEFORE DESTINATION POINT
1KM BEFORE DESTINATION POINT
100M BEFORE DESTINATION POINT

24

FIG. 6

25

GUIDE CONTENTS TABLE						
GUIDE TIMING		ELEMENT NUMBER (REPRODUCED FROM LEFT TO RIGHT)				
AT THE START OF ROUTE GUIDANCE		1	2			
BEFORE GUIDE OBJECT INTERSECTION	700m	4	10	*j	18	
	300m	4	12	*j	18	
	100m	5	*j	18		
BEFORE DESTINATION POINT	2km	4	8	14	18	
	1km	4	9	14	18	
	100m	6	14	18	1	3

FIG. 7

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REQUEST MANAGEMENT TABLE		
CONTENT OF GUIDE REQUEST	INPUT TIMING	NUMBER OF TIMES OF INPUT
"MEJIRUSHI WA? (WHAT IS THE LANDMARK?)"	—	N1
"KOUSA TEN NO NAMAE WA? (WHAT IS THE NAME OF THE INTERSECTION?)"	—	N2
"SHOYOU JIKAN WA? (HOW LONG DOES IT TAKE?)"	AT THE START OF ROUTE GUIDANCE	N3
	AFTER THE START OF ROUTE GUIDANCE	N4
"KYORI WA? (HOW FAR IS IT?)"	AT THE START OF ROUTE GUIDANCE	N5
	AFTER THE START OF ROUTE GUIDANCE	N6
"KOKO? (IS IT HERE?)"	JUST BEFORE NON-GUIDE OBJECT INTERSECTION	N7
	JUST BEFORE GUIDE OBJECT INTERSECTION	N8

FIG. 8

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RESPONSE CONTENTS TABLE						
CONTENT OF GUIDE REQUEST	INPUT TIMING	ELEMENT NUMBER				
"MEJIRUSHI WA? (WHAT IS THE LANDMARK?)"	—	*k	13	18		
"KOUSA TEN NO NAMAE WA? (WHAT IS THE NAME OF THE INTERSECTION?)"	—	*m	18			
"SHOYOU JIKAN WA? (HOW LONG DOES IT TAKE?)"	AT THE START OF ROUTE GUIDANCE	16	4	*n	22	18
	AFTER THE START OF ROUTE GUIDANCE	24	4	*n	22	18
"KYORI WA? (HOW FAR IS IT?)"	AT THE START OF ROUTE GUIDANCE	15	4	*s	19	18
	AFTER THE START OF ROUTE GUIDANCE	24	4	*s	19	18
"KOKO? (IS IT HERE?)"	—	*p				

FIG. 9

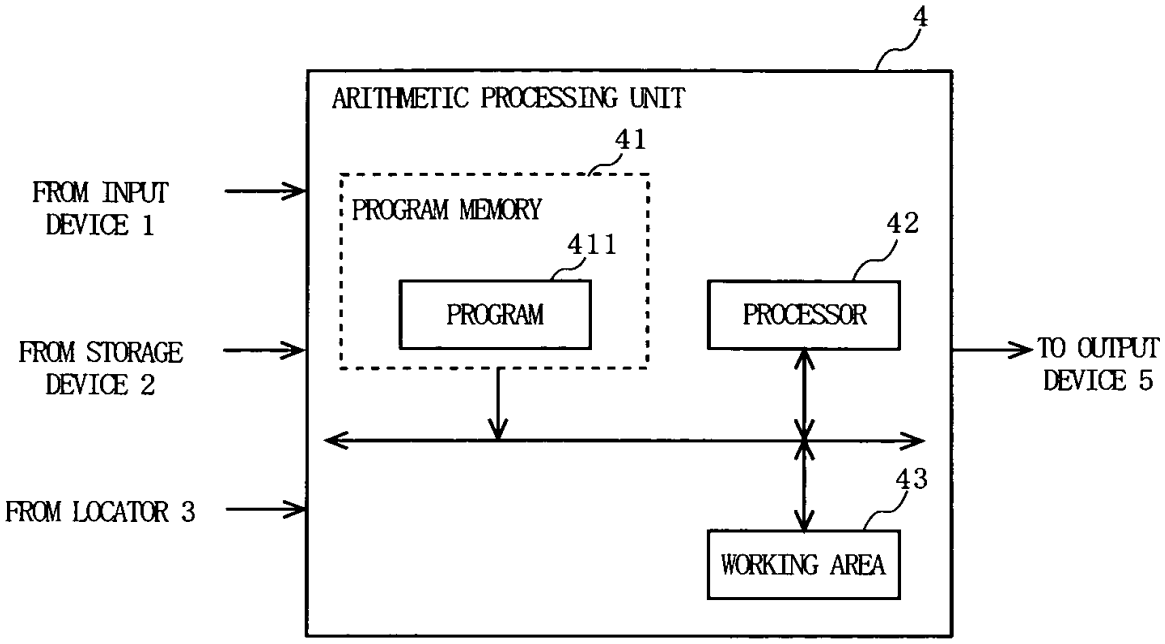
4
ARITHMETIC PROCESSING UNIT
41
PROGRAM MEMORY
411
PROGRAM
42
PROCESSOR
43
WORKING AREA
FROM INPUT DEVICE 1
FROM STORAGE DEVICE 2
FROM LOCATOR 3
TO OUTPUT DEVICE 5

FIG. 10A

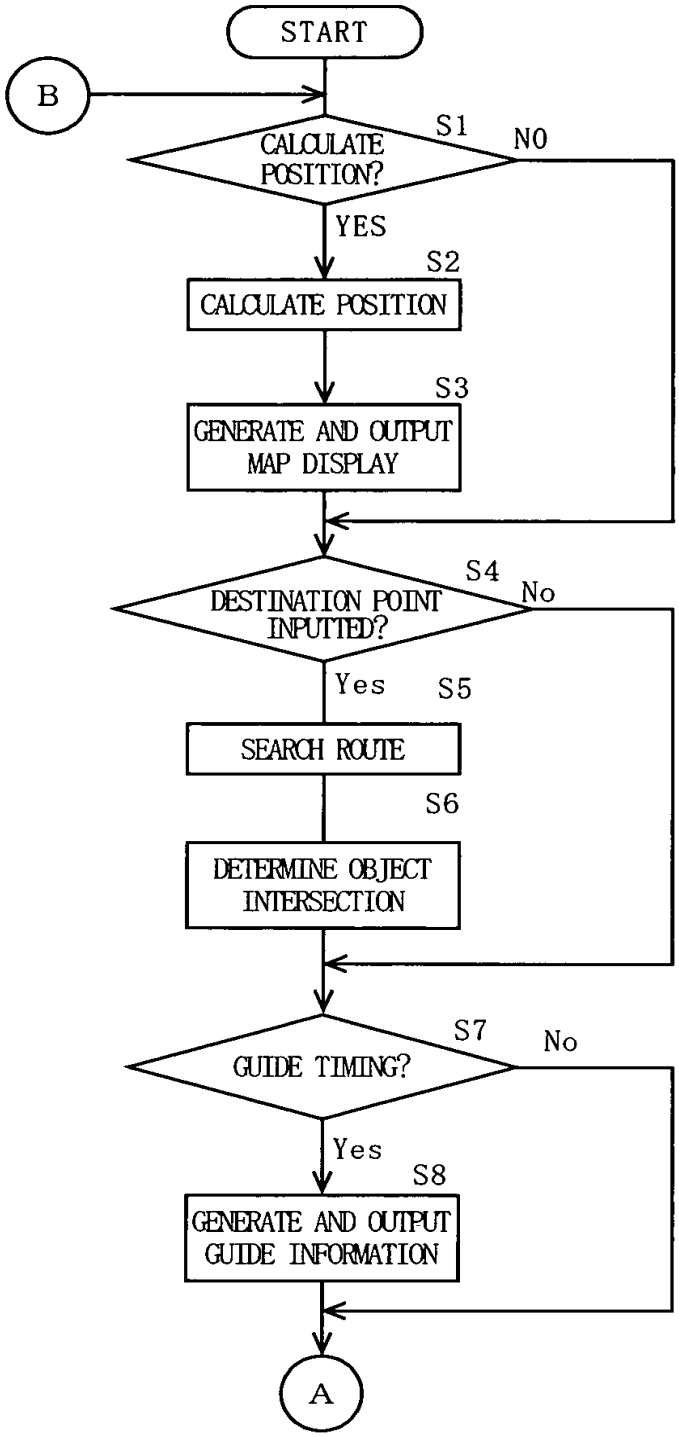
START
B
S1
CALCULATE POSITION?
NO
YES
S2
CALCULATE POSITION
S3
GENERATE AND OUTPUT MAP DISPLAY
S4
DESTINATION POINT INPUTTED?
No
Yes
S5
SEARCH ROUTE
S6
DETERMINE OBJECT INTERSECTION
S7
GUIDE TIMING?
No
Yes
S8
GENERATE AND OUTPUT GUIDE INFORMATION
A

FIG. 10B

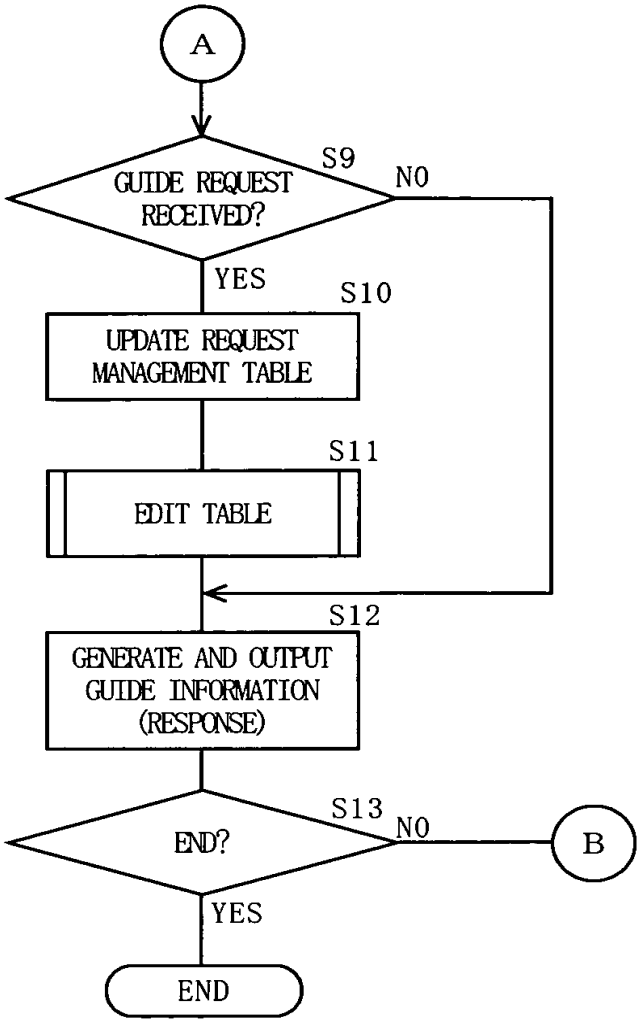
A
S9
GUIDE REQUEST RECEIVED?
NO
YES
S10
UPDATE REQUEST MANAGEMENT TABLE
S11
EDIT TABLE
S12
GENERATE AND OUTPUT GUIDE INFORMATION (RESPONSE)
S13
END?
NO
B
YES
END

FIG. 11

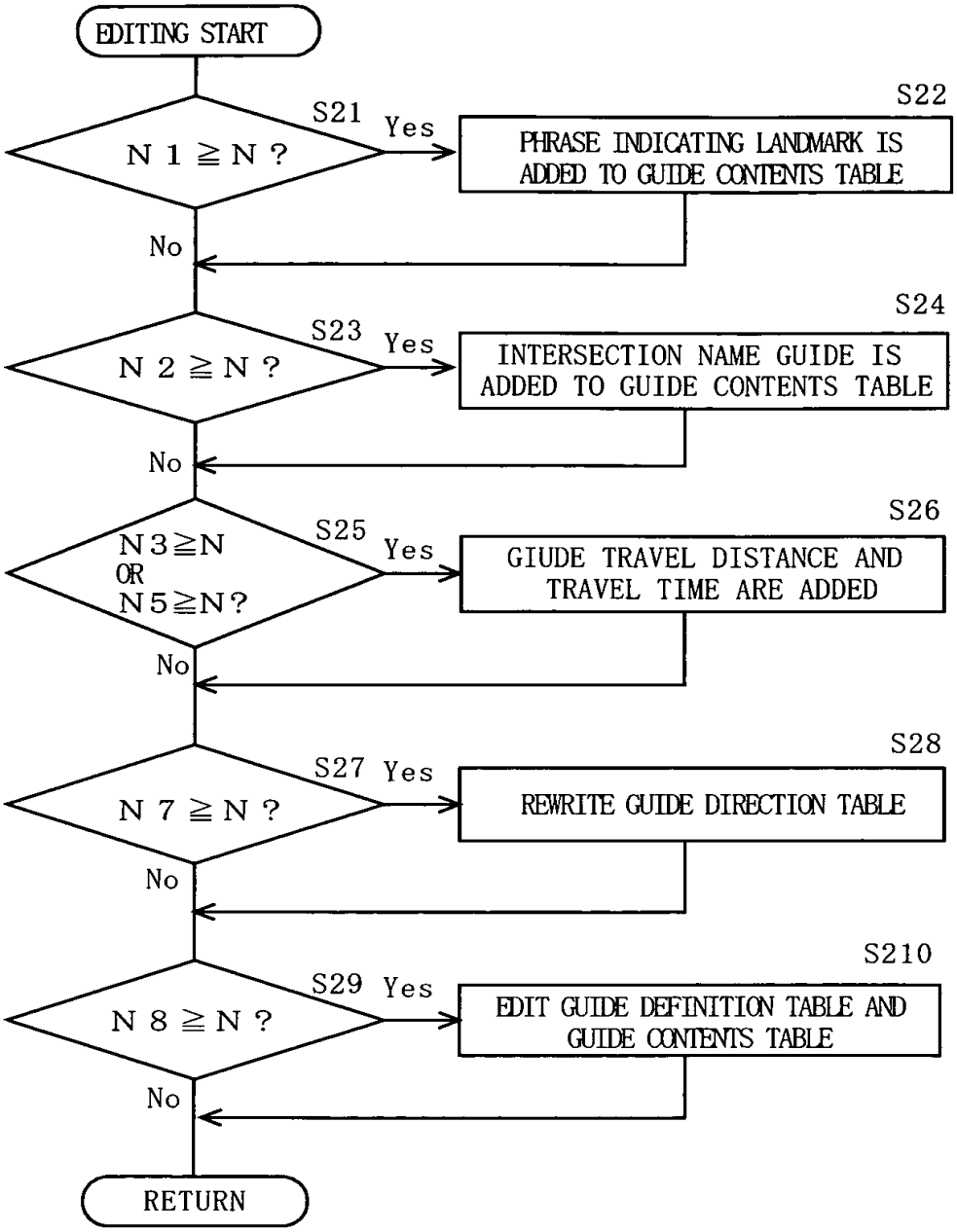
EDITING START
S21
N 1 ≧ N ?
Yes
S22
PHRASE INDICATING LANDMARK IS ADDED TO GUIDE CONTENTS TABLE
No
S23
N 2 ≧ N ?
Yes
S24
INTERSECTION NAME GUIDE IS ADDED TO GUIDE CONTENTS TABLE
No
S25
N3≧N OR N5≧N?
Yes
S26
GIUDE TRAVEL DISTANCE AND TRAVEL TIME ARE ADDED
No
S27
N 7 ≧ N ?
Yes
S28
REWRITE GUIDE DIRECTION TABLE
No
S29
N 8 ≧ N ?
Yes
S210
EDIT GUIDE DEFINITION TABLE AND GUIDE CONTENTS TABLE
No
RETURN

FIG. 12

25

GUIDE CONTENTS TABLE								
GUIDE TIMING		ELEMENT NUMBER (REPRODUCED FROM LEFT TO RIGHT)						
AT THE START OF ROUTE GUIDANCE		1	2					
BEFORE GUIDE OBJECT INTERSECTION	700m	4	10	*j	18	*q	13	18
	300m	4	12	*j	18	*q	13	18
	100m	5	*j	18	*q	13	18	
BEFORE DESTINATION POINT	2km	4	8	14	18			
	1km	4	9	14	18			
	100m	6	14	18	1	3		

FIG. 13

25

GUIDE CONTENTS TABLE						
GUIDE TIMING		ELEMENT NUMBER (REPRODUCED FROM LEFT TO RIGHT)				
AT THE START OF ROUTE GUIDANCE		1	2			
BEFORE GUIDE OBJECT INTERSECTION	700m	4	10	*r	*j	18
	300m	4	12	*r	*j	18
	100m	5	*r	*j	18	
BEFORE DESTINATION POINT	2km	4	8	14	18	
	1km	4	9	14	18	
	100m	6	14	18	1	3

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FIG. 14

27

GUIDE CONTENTS TABLE										
GUIDE TIMING		ELEMENT NUMBER (REPRODUCED FROM LEFT TO RIGHT)								
AT THE START OF ROUTE GUIDANCE		1	2	15	*s	19	16	*n	22	18
BEFORE GUIDE OBJECT INTERSECTION	700m	4	10	*j	18					
	300m	4	12	*j	18					
	100m	5	*j	18						
BEFORE DESTINATION POINT	2km	4	8	14	18					
	1km	4	9	14	18					
	100m	6	14	18	1	3				

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FIG. 15A

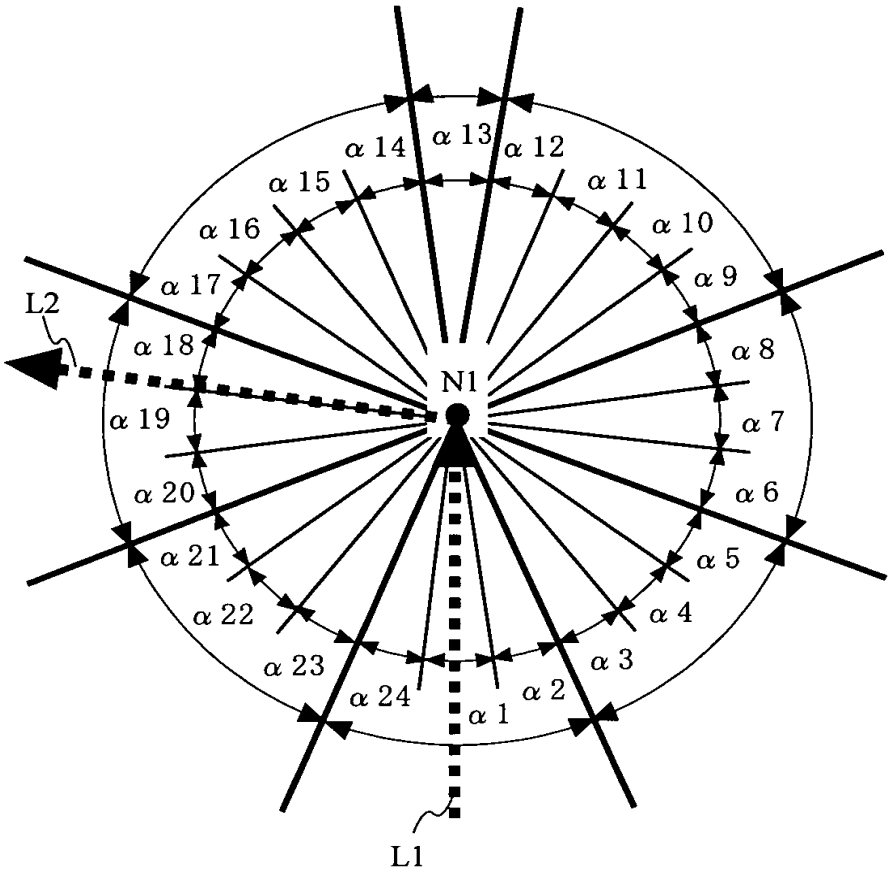

FIG. 15B

23

GUIDE DIRECTION TABLE	
ANGULAR RANGE	GUIDE DIRECTION
α 13	CHOKUSHIN HOUKOU (STRAIGHTFORWARD) (NO GUIDANCE)
α 14- α 17	HIDARI NANAME ZENPOU (DIAGONALLY FORWARD LEFT)
α 18- α 20	HIDARI HOUKOU (LEFT)
α 21- α 23	HIDARI NANAME KOUHOU (DIAGONALLY BACKWARD LEFT)
α 24, α 1, α 2	U TAAN HOUKOU (U-TURN DIRECTION)
α 3- α 5	MIGI NANAME KOUHOU (DIAGONALLY BACKWARD RIGHT)
α 6- α 8	MIGI HOUKOU (RIGHT)
α 9- α 12	MIGI NANAME ZENPOU MIGI (DIAGONALLY FORWARD RIGHT)

FIG. 16

24

GUIDE TIMING TABLE
AT THE START OF ROUTE GUIDANCE
700M BEFORE GUIDE OBJECT INTERSECTION
300M BEFORE GUIDE OBJECT INTERSECTION
100M BEFORE GUIDE OBJECT INTERSECTION
2KM BEFORE DESTINATION POINT
1KM BEFORE DESTINATION POINT
100M BEFORE DESTINATION POINT
40M BEFORE GUIDE OBJECT INTERSECTION

FIG. 17

25

GUIDE CONTENTS TABLE						
GUIDE TIMING		ELEMENT NUMBER (REPRODUCED FROM LEFT TO RIGHT)				
AT THE START OF ROUTE GUIDANCE		1	2			
BEFORE GUIDE OBJECT INTERSECTION	700m	4	10	*j	18	
	300m	4	12	*j	18	
	100m	5	*j	18		
	40m	*j	18			
BEFORE DESTINATION POINT	2km	4	8	14	18	
	1km	4	9	14	18	
	100m	6	14	18	1	3
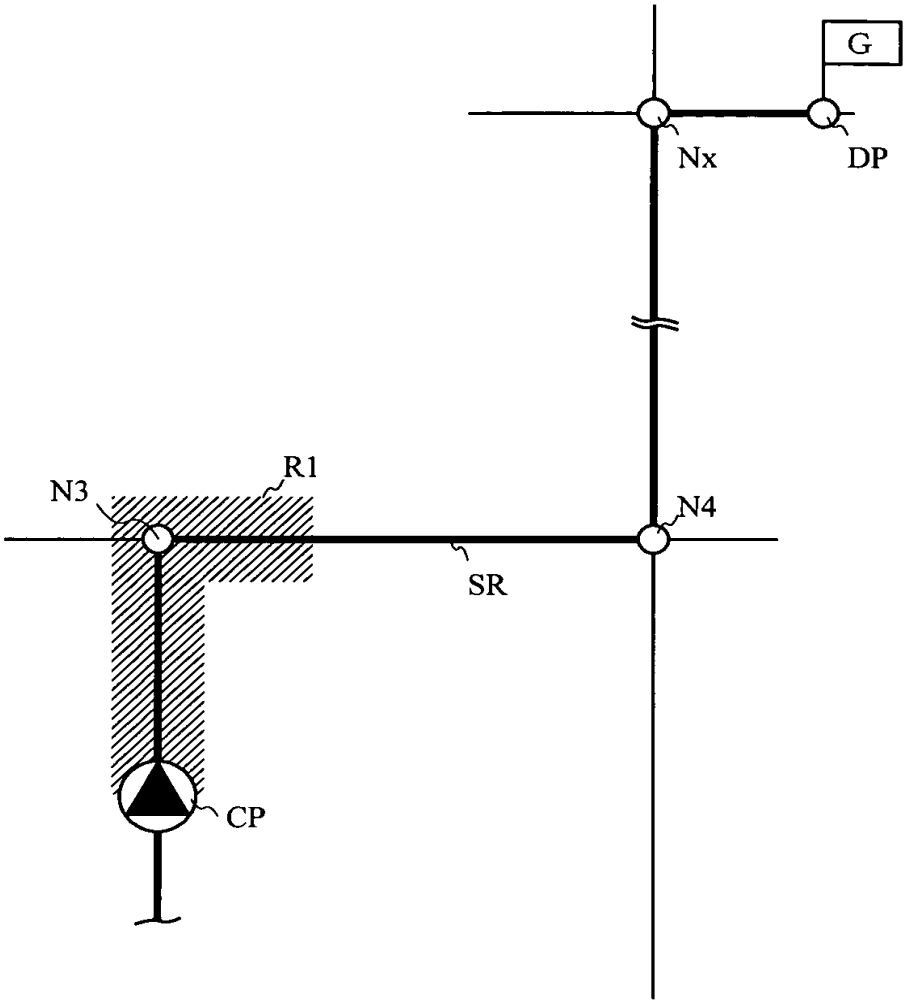
FIG. 18